

Sage Sparrow  
*Amphispiza belli*

*Prepared by Matthew Vander Haegen*

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## GENERAL RANGE AND WASHINGTON DISTRIBUTION

Sage sparrows breed from southeastern Washington to northwestern Colorado, and south to southern California, northern Arizona and northwestern New Mexico (Martin and Carlson 1998). They winter at low elevations in southern portions of their range (Farrand 1983).

In Washington, their distribution coincides with sagebrush (*Artemisia* spp.) and bunchgrass (*Agropyron* spp.) Communities of the central portion of the state (Larrison and Sonnenberg 1968). Sage sparrows are documented in Adams, Benton, Douglas, Franklin, Grant, Kittitas, Lincoln, Okanogan and Yakima Counties (Smith et al. 1997).



Breeding range of the sage sparrow, *Amphispiza belli*, in Washington. Map derived from Smith et al. 1997.

## RATIONALE

The sage sparrow is a State Candidate species that depends almost entirely on sagebrush-steppe habitat (Braun et al. 1976, Rich 1980, Reynolds 1981, Petersen and Best 1985). This habitat in Washington has become severely fragmented and reduced in extent over the last century (Dobler et al. 1996), particularly the deep-soil communities that this species apparently prefers (Vander Haegen et al. 2000). Furthermore, the Interior Columbia River Basin Ecosystem Management Project listed the sage sparrow as a species of high management concern for the region (Saab and Rich 1997).

## HABITAT REQUIREMENTS

Sage sparrows are closely associated with sagebrush-steppe plant communities (Braun et al. 1976, Wiens and Rotenberry 1981). Sagebrush-steppe describes a plant community consisting of one or more layers of grasses and forbs with a discontinuous overstory of sagebrush shrub cover (Daubenmire 1988). Sage sparrows are sensitive to fragmentation of sage cover and are found more frequently in extensive areas of continuous sage (Knick and Rotenberry 1995, Vander Haegen et al. 2000).

Sage sparrows commonly nest within or beneath sagebrush plants (Martin and Carlson 1998). Nesting takes place from late March through June, with pairs typically producing 1-2 broods/year (Bent 1968, Alcorn 1978, Rich 1980, Ryser 1985, Petersen and Best 1987). Shrubs that are at least 75% living are selected for nesting, and nests are always located outside of the dead portion of the shrub (Petersen and Best 1985). The height of shrubs used for nesting generally ranged between 40 and 100 cm (16-40 in) (Rich 1980, Reynolds 1981, Petersen and Best 1985) and averaged 90 cm (35 in) in eastern Washington (Washington Department of Fish and Wildlife, unpublished data).

Contiguous breeding territories generally are established by males in March (Petersen and Best 1987). Territory sizes of mated males vary greatly (Weins et al. 1985), ranging from 0.8 ha (2 ac) (Petersen and Best 1987) to 4.4 ha (11 ac) (Rich 1980). A study in southeastern Washington found that the size of breeding territories ranged between 0.65 ha (1.6 ac) and 1.57 ha (3.9 ac); territories also tended to decrease in size with an increase in population density (Weins et al. 1985). Boundaries between adjacent territories have been found to overlap, and the size and shape may fluctuate daily during the breeding season (Rich 1980).

In spring, sage sparrows are primarily insectivorous, feeding on grasshoppers, beetles and moth larvae (Martin and Carlson 1998). They glean food from the ground and from shrub branches within reach of the ground (Moldenhauer and Wiens 1970, Petersen and Best 1985, Ryser 1985). Sparrows also have been observed walking to and from their nests (T. Rich personal communication and B.M. Winter personal communication *in* Petersen and Best 1985). Thus, optimal foraging habitat should include an overstory of shrubs with clearings in the grass/forb layer to allow movement on the ground (Petersen and Best 1985).

## LIMITING FACTORS

Availability of extensive sagebrush-steppe habitat is a primary factor limiting sage sparrow populations (Martin and Carlson 1998, Vander Haegen et al. 2000). Sage sparrows are sensitive to fragmentation of sagebrush stands and are found more frequently in large, undisturbed stands (Vander Haegen et al. 2000). Degradation of sagebrush stands by invasive plants such as cheatgrass (*Bromus tectorum*) also may render sites less suitable to sage sparrows (Dobler et al. 1996).

## MANAGEMENT RECOMMENDATIONS

Sage sparrows are dependent on stands of sagebrush for nest sites, food, and cover (Martin and Carlson 1998). In order to maintain sage sparrow populations, sagebrush communities should be left in relatively undisturbed condition and fragmentation should be avoided. Management activities that increase cheatgrass and other exotic species that increase the risk of wildfire also should be avoided.

Optimum habitat for sage sparrows in Washington consists of large (>1000ha) blocks of sagebrush-steppe with sagebrush cover ranging from 10-25% and shrubs averaging >50 cm in height (Altman and Holmes 2000). Herbaceous cover of native species should average >10%, with \$10% of the ground remaining bare (including areas of cryptogamic crust) to allow movement on the ground. Exotic annual grasses should cover <10% of the ground. Although much of Washington's sagebrush-steppe is fragmented by agriculture, habitat restoration on formerly tilled fields could expand the range of sagebrush-steppe obligate birds in fragmented landscapes (Vander Haegen et al. 2000).

Removal of sagebrush should be avoided, with the exception of rare instances when reducing shrub cover is necessary to meet ecological goals of habitat restoration (Wisdom et al. 2000). Sagebrush cover should be reduced on a site only after careful consideration of how the methods used may affect sagebrush regeneration and the opportunity for exotic vegetation to invade the site. Burning may lead to serious negative impacts to local sage sparrow populations because the damage is immediate and regeneration to pre-burn condition may take up to 30 years (Harniss and Murray 1973). Fire is not a suitable tool to reduce sagebrush cover in low rainfall zones (e.g., Benton, Franklin, and Grant Counties) where exotic vegetation often becomes dominant and sagebrush is slow to recover (Knick and Rotenberry 1995, Wisdom et al. 2000). If chemical use is planned for areas where this species occurs, refer to Appendix A for a list of contacts to consult when using and assessing pesticides, herbicides and their alternatives.

Although limited data are available on this subject, livestock grazing at low to moderate levels has not been shown to be detrimental to sage sparrow habitat (Saab et al. 1995). Because sage sparrows in Washington frequently nest on the ground early in the spring (Washington Department of Fish and Wildlife, unpublished data), and because they primarily forage at ground level, grazing

levels should be kept at low levels (Altman and Holmes 2000). Researchers suggest allowing >50% of the year's growth of perennial bunchgrass to persist through the following breeding season.

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## KEY POINTS

### Habitat Requirements

- Strong association with sagebrush habitat, especially in extensive, unfragmented stands.
- Sagebrush cover between 10 and 25%, with shrubs averaging >50 cm in height.
- Herbaceous cover (native species) >10%, with \$10% of the ground bare (including areas of cryptogamic crust); exotic annual grasses should cover <10% of the ground.

### Management Recommendation

- Retain large blocks of sagebrush communities and avoid fragmentation of existing stands.
- Establish or retain 10-25% sagebrush cover and shrubs averaging >50 cm in height. Maintain an herbaceous cover of native species averaging >10%, with \$10% of the ground bare (including areas of cryptogamic crust). Reduce exotic annual grasses to <10% of the ground cover.
- Avoid activities that may increase invasion of cheatgrass and other exotic vegetation.
- Livestock grazing should be kept at low to moderate levels, with >50% of the year's growth of perennial bunchgrass persisting through the following breeding season.
- Control wildfires in sagebrush habitat, especially in low rainfall zones.
- Refer to Appendix A for a list of contacts to consult when using and assessing pesticides, herbicides and other alternatives.
- Avoid the removal of sagebrush, with the exception of rare instances when reducing shrub cover is necessary to meet ecological goals of habitat restoration.